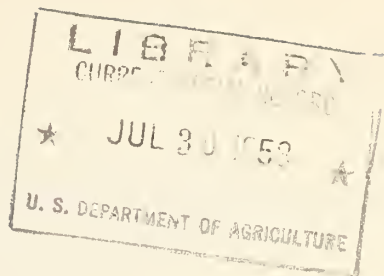


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FATS and OILS

**consumption in
prepared
animal
feeds**



AMS-252

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
MARKETING RESEARCH DIVISION
WASHINGTON, D. C. MAY 1958

PREFACE

This study is a part of a broad program of research conducted by the United States Department of Agriculture to assist in the development of markets for agricultural products. The information on consumption of various kinds and grades of fats and oils in prepared animal feeds, according to region and size of mill, should be of help to management in appraising the importance of the outlet and in making plans for expanding the use of fats and oils in feeds.

Acknowledgment is made to the Bureau of the Census which collected and tabulated the basic data, and particularly to Willis K. Jordan, Chief, Foods, Apparel and Textiles Branch, Industry Division, and Edward A. Robinson of that Branch.

This study was conducted under the direction of Marshall E. Miller, and the initial plans were developed by Morris W. Sills, both of the Market Development Branch.

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FATS AND OILS CONSUMPTION IN PREPARED ANIMAL FEEDS

By Harry O. Doty, Jr., agricultural economist
Market Development Branch

SUMMARY

The mixed feed industry in the United States in 1956 used about 324 million pounds of fats and oils in prepared animal feeds, and was the second largest domestic outlet for inedible tallow and grease. Only the soap industry consumed a larger quantity (813 million pounds).

Consumption of fats and oils in mixed feeds in 1956 was reported by considerably more than one-third of the manufacturing establishments surveyed. Use of fats and oils in prepared animal feeds more than doubled in comparison with use in feeds 2 years earlier (1954). The feed industry used about 18 percent of all the inedible tallow and grease consumed in the United States in 1956. These results are based on a special survey of feed manufacturing establishments conducted jointly by the Bureau of the Census and the Agricultural Marketing Service.

More recent reports by the Bureau of the Census (Facts for Industry--Fats and Oils) indicate continued increases in usage in 1957. While these reports are not strictly comparable to the special industry-wide survey on usage in 1956 because of differences in coverage of responding establishments, the 1958 Census of Manufactures will yield information on usage of fats in feeds comparable to that of this survey.

Production of prepared animal feeds amounted to 28.8 million tons in 1956. Plants adding fats to feeds produced almost three-fourths of this total, and fats constituted about 0.8 percent of all the prepared animal feeds these plants manufactured in 1956.

Tallow and grease together accounted for approximately 300 million pounds or 92 percent of the total quantity of fats and oils going into mixed feeds in 1956. Tallow alone amounted to 73 percent of the total; grease, 19 percent; soapstock and foots, 2 percent; and other fats and oils, 6 percent. The principal items were prime tallow, which accounted for 29 percent of the total fats and oils added to animal feeds; fancy tallow, 26 percent; and yellow grease, 13 percent. These grades of tallow and grease made up 68 percent of all fats and oils used in prepared animal feed in 1956.

Large feed mills accounted for about 74 percent of the fats and oils used by the feed industry; medium-size mills, 19 percent; and small mills, 7 percent.

The quantity of fats and oils incorporated into mixed feed varied widely among the nine census regions. The major consuming regions were the East North Central, South Atlantic, and Middle Atlantic, which together accounted for about 57 percent of fats and oils used.

BACKGROUND AND METHODOLOGY

The purpose of this study was to determine the quantities and types of fats and oils being used in mixed feeds and the importance of this relatively new outlet in absorbing surplus fats and oils. At the time that production of tallow and grease was increasing by over a billion pounds, from 1947 to 1956, about two-thirds of the soap market, which formerly took most of the inedible fats, was taken over by synthetic detergents.

The possibilities of expanding the use of fats in feeds were made evident through animal feeding experiments. Many of the problems, particularly those of oxidation and rancidity of fats, which had to be solved to make this outlet for fats feasible, were worked out in the research program of the Eastern Utilization Research and Development Division of the Department of Agriculture, including research sponsored under contracts. The addition of fats to feed formulas has a number of advantages both for manufacturers of mixed feeds and for livestock feeders. The addition of fats to feeds has also enabled processors to extract practically all of the high-priced oil from oilseeds, replacing it with low-priced inedible animal fats and refiners' foots.

The use of fats in feeds has grown rapidly in the past few years. However, producers and processors heretofore had little specific information regarding usage on which to appraise the importance of the outlet or to base plans for expanding the use of fats in feeds. Therefore, data were obtained by the Bureau of the Census for the Department of Agriculture from 1,918 plants manufacturing prepared animal feed on their use of animal and vegetable fats and oils in mixed feeds for the calendar year 1956. ^{1/} No data were collected on the use of fats and oils by types of feed. Further study on practices followed and the factors involved in adding fats to the various types of feeds will be carried out to enable a more complete appraisal of market potentials.

^{1/} Includes establishments which reported total shipments of prepared animal feeds valued at more than \$20,000 in the 1954 Census of Manufactures. Establishments having shipments of prepared animal feeds valued at \$20,000 or less were excluded. These small mills accounted for about 3 percent of all mixed feed produced in 1954. Also excluded were such firms as grain elevators, custom or grist mills, and farm-supply stores which may engage in feed mixing, but whose primary activity is not manufacturing. Alfalfa dehydrator operators who did not manufacture mixed feeds were not included in the study, although they may use fats and oils.

USE OF FATS AND OILS IN FEEDS

In 1956 the feed industry used about 324 million pounds of fats and oils in prepared animal feeds (tables 1-6). ^{2/} Comparable data for earlier years are not available. However, in the 1954 Census of Manufactures, the feed manufacturing industry reported a total usage of fats and oils of 151 million pounds. This included some other uses in addition to feeds. These data indicate that in the 2-year period following 1954, fats and oils consumed in prepared animal feeds more than doubled.

Monthly figures on use of fats and oils in feeds are reported by the Bureau of the Census in its Facts for Industry -- Fats and Oils, series M28-2-127. These data are not strictly comparable because they do not include many of the establishments which reported using fats in feeds in the special 1956 survey. However, the current reports indicate that use of fats in feeds has continued to increase at a rapid pace, and that use in 1957 might well be some 30 percent higher than in 1956. The 1958 Census of Manufactures will yield information comparable to that found in the 1956 survey.

In the special industry-wide survey of 1956, the Bureau of the Census reported 28.8 million tons of prepared animal feeds produced. ^{3/} Well over one-third of the plants producing prepared animal feeds also reported consumption of fats and oils in their manufacture (table 1). Manufacturing plants using fats and oils in feeds produced almost three-fourths of the total prepared animal feeds in 1956. Fats constituted about 0.8 percent of the total weight of prepared animal feeds manufactured in these plants (table 7).

Kinds of Fats and Oils Used

Many kinds and grades of animal and vegetable fats and oils are suitable for incorporation in feeds and feed ingredients. Because of the cost, the fats and oils used in feeds are usually limited to those commonly referred to as inedible fats and oils. Their characteristics vary considerably in such factors as stability, hardness (titer), free fatty acid content (F.F.A.), impurities (moisture and insoluble and unsaponifiable material, abbreviated M.I.U.) and color. The characteristics of the commonly recognized grades of inedible tallows and greases are outlined in table 8.

^{2/} Excluded by definition of fats and oils added to feeds were formulated vitamin oils and the oil content of such materials as cottonseed meal, soybean meal, fish solubles, tankage, meat scrap, and unrendered animal fats. Also excluded were fats and oils added to frozen dog or cat food.

^{3/} U. S. Dept. Commerce, Bureau of the Census Facts for Industry. Production of Mixed Feeds in Manufacturing Establishments, 1956, Series M20E-06, March 20, 1958.

The approximately 300 million pounds of inedible tallow and grease consumed by the feed industry in 1956 made that industry the second largest domestic outlet for inedible tallow and grease (table 1). Only the soap industry in 1956 consumed a larger quantity of inedible tallow and grease (813 million pounds). The feed industry used about 18 percent of all the inedible tallow and grease consumed in the United States in 1956.

Tallow accounted for 73 percent of the total volume of fats and oils used in mixed feeds in 1956 (fig. 1). Grease constituted 19 percent of all fats and oils added to feeds; soapstock and foots, 2 percent; and other fats and oils, 6 percent. ^{4/} Tallow and grease together accounted for 92 percent of all the fats and oils used in factory-prepared feeds.

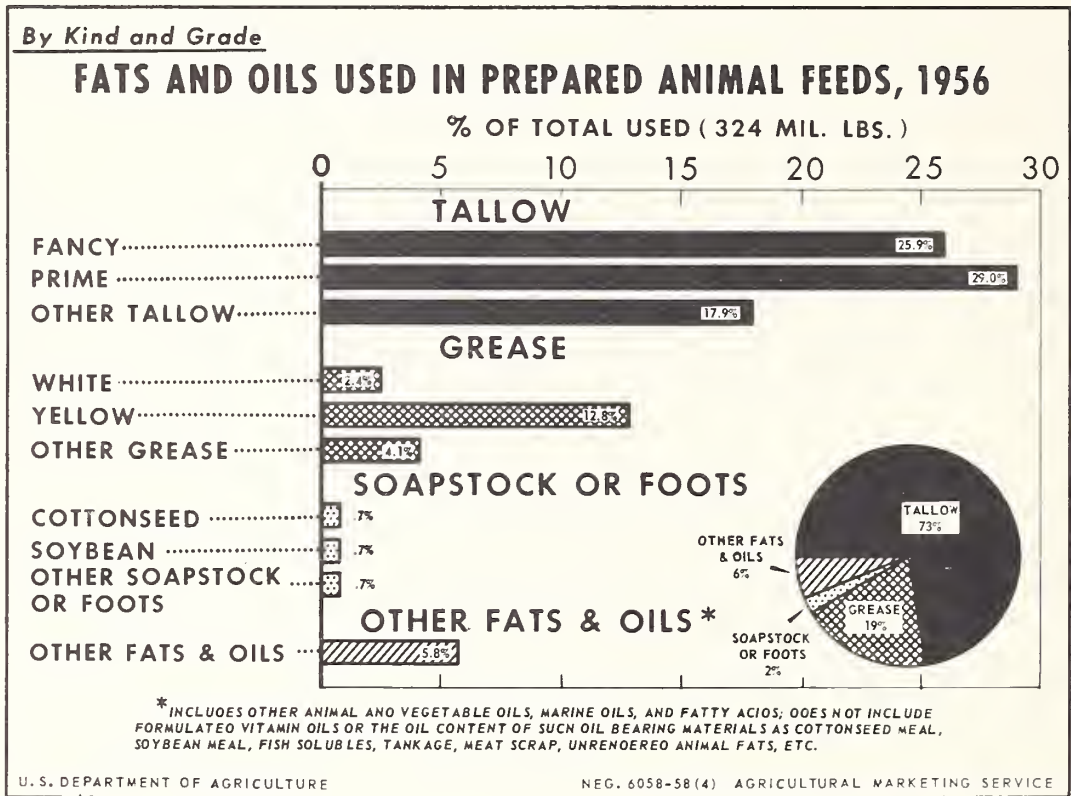


Figure 1

To give a better picture of the quantities of the various kinds and grades of inedible fats and oils used in mixed feeds, the categories mentioned above were further broken down. Prime tallow accounted for 29 percent of the total fats and oils used in animal feeds; fancy tallow, 26

^{4/} Includes other animal and vegetable oils, marine oils, and fatty acids. Does not include formulated vitamin oils or the oil content of such materials as cottonseed meal, soybean meal, and fish solubles, tankage, meat scrap, and unrendered animal fats.

percent; and yellow grease, 13 percent (fig. 1). These grades of inedible tallow and grease together made up 68 percent of all the fats and oils used in prepared animal feeds in 1956. Tallows other than prime or fancy constituted 18 percent of the quantity of fats and oils used in mixed feeds; other fats and oils, including marine oils, 6 percent; greases other than white or yellow, 4 percent; white grease, 2 percent; and cottonseed, soybean, and other soapstocks and foots each contributed 0.7 percent of the total.

Use by Size of Mill

Large variations by size of mills occurred in the quantity of fats and oils incorporated into feeds. Large mills, manufacturing at least 50,000 tons of mixed feed annually, used 74 percent of all the fats and oils added to prepared feed in 1956; medium-sized mills, manufacturing 10,000 to 50,000 tons of mixed feeds annually, accounted for 19 percent; and small mills, manufacturing less than 10,000 tons of mixed feeds annually, accounted for 7 percent (table 2).

Mills of all 3 sizes used tallow principally, followed by grease, other fats and oils, and soapstock and foots, in that order (table 3). The only exception was in medium-size mills, where soapstock and foots were used in slightly larger quantities than other fats and oils.

The proportions of the various kinds and grades of fats and oils used in feeds varied among the 3 sizes of mills even though the order of ranking did not change. Tallow made up from 68 to 74 percent of all the fats and oils used in feeds, depending on size of mill. The proportion of the total accounted for by tallow increased as the size of mill increased (table 3). There were wide differences in the grades of tallow used by mills of different sizes. In small mills, 52 percent of the total fats used in prepared feeds were tallows other than fancy or prime. In medium-size mills, fancy, prime, and other tallows each accounted for 22 to 26 percent of the total fats employed. In large mills, fancy and prime tallow each accounted for about 30 percent of the total fats used.

Grease made up 24 percent of all fats added to feed in medium-size mills, compared with 18 percent in both the small and large mills. The proportions of various grades of grease used in feeds were similar for mills of each size, except that medium-size mills used a much higher proportion of yellow grease (table 3). Yellow grease accounted for 19 percent of all fats and oils used in these mills.

Soapstock and foots made up only from 1 to 6 percent of the fats and oils used in feeds; the proportion decreased as the size of mill increased. Relative importance of other fats and oils varied among sizes of mills. In small mills they accounted for 9 percent of the total fats incorporated into feeds. In medium-size mills, they made up 2 percent; in large mills 6 percent of the total was composed of these fats and oils (table 3).

Use by Regions

Large variations occurred among the 9 census regions of the United States in the quantity of fats and oils consumed in feeds in 1956 (table 4). The feed plants in the East North Central region used 22 percent of all the fats and oils incorporated in feeds; those in the South Atlantic used 19.5 percent and those in the Middle Atlantic 15.5 percent (fig. 2). Feeds manufactured in these 3 regions contained 57 percent of the total fats and oils added to feeds. Feed mixed in the West North Central and West South Central regions each contained 11 percent of the total fats and oils used in feeds and those produced in the East South Central region, 9 percent. Feeds manufactured in the other 3 regions (Pacific, New England, and Mountain) took only 11 percent of the total fats and oils used in feeds (table 5). For regional comparisons of fats and oils used with the quantity of feeds manufactured by plants adding fats, see table 7.

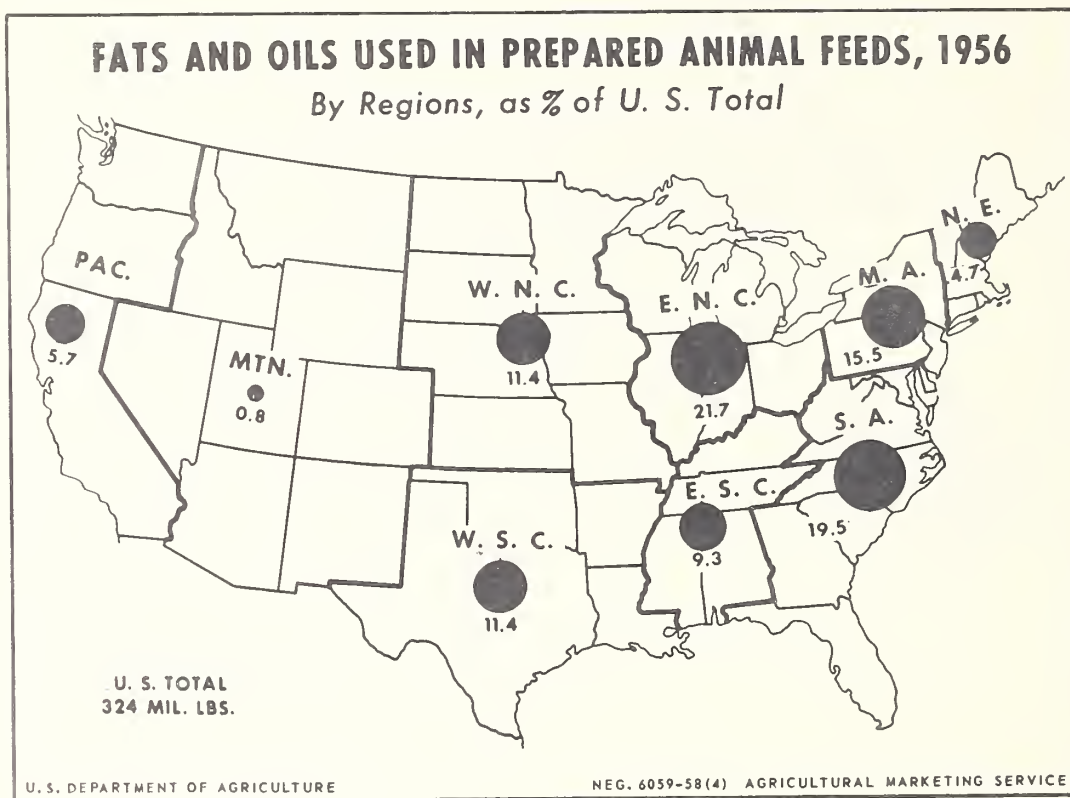


Figure 2

Wide variation occurred among regions in the kinds and grades of fats and oils incorporated in prepared feeds. In each of the 9 regions over 60 percent of the fats and oils added to feeds was tallow (table 6). The proportion of tallow varied from 61 percent in the East North Central region to 98 percent in New England. There appeared to be no consistency among regions in the grades of tallow used.

In several regions grease made up a large proportion of the fats and oils incorporated into feeds, while in other regions practically no grease was used. In the East North Central region grease was the highest proportion, 32 percent, of all fats and oils incorporated into feeds (table 6). There was little or no consistency in the grades of grease employed. In the East North Central region, 26 percent of all fats and oils used in feeds was yellow grease, while in the West North Central region, white grease and yellow grease each accounted for about 12 percent of all fats used.

Soapstock or foots were not used in large quantities in feed in any region. However, they were used more in the West South Central region than in any other. There they accounted for 6 percent of all fats added to feeds.

Differences occurred among regions in the use of other fats and oils. Larger quantities were used in feeds in the Middle Atlantic and Pacific than in other regions (table 6). Other fats and oils made up 16 percent in the Middle Atlantic region, and 14 percent in the Pacific region, of the total fats and oils used in feeds.

Table 1.--Consumption of fats and oils in feeds, by size of mill, 1956

Kind and grade	Total all mills	Size of Mill ^{1/}		
		Less than 10,000 tons	10,000 to 50,000 tons	50,000 tons and over
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Tallow:				
Fancy.....	83,852	1,269	13,194	69,389
Prime.....	94,073	2,442	13,908	77,723
Other tallow.....	58,205	12,682	15,598	29,925
Total.....	236,130	16,393	42,700	177,037
Grease:				
White.....	7,661	705	1,656	5,300
Yellow.....	41,486	2,318	11,569	27,599
Other grease.....	13,247	1,248	1,411	10,588
Total.....	62,394	4,271	14,636	43,487
Soapstock or foots:				
Cottonseed.....	2,328	458	255	1,615
Soybean.....	2,152	772	1,069	311
Other soapstocks or foots.....	2,236	116	935	1,185
Total.....	6,716	1,346	2,259	3,111
Other fats and oils ^{2/} :	18,923	2,214	1,399	15,310
Total all fats and oils.....	324,163	24,224	60,994	238,945
Mills manufacturing mixed feeds:				
Adding fats.....	697	313	183	201
Not adding fats..	1,221	1,046	133	42
Total.....	1,918	1,359	316	243

^{1/} In terms of annual production of mixed feed.

^{2/} Includes other animal and vegetable oils, marine oils, and fatty acids. Does not include formulated vitamin oils or the oil content of such materials as cottonseed meal, soybean meal, fish solubles, tankage, meat scrap, and unrendered animal fats.

Table 2.--Proportion of total consumption of various fats and oils used in feed, by size of mill, 1956

Kind and grade	Total all mills	Size of mill <u>1/</u>			Total
		Less than 10,000 tons	10,000 to 50,000 tons	50,000 to over tons	
	1,000 pounds	Percent	Percent	Percent	Percent
Tallow:					
Fancy.....	83,852	1.5	15.7	82.8	100.0
Prime.....	94,073	2.6	14.8	82.6	100.0
Other tallow....	58,205	21.8	26.8	51.4	100.0
Total.....	236,130	6.9	18.1	75.0	100.0
Grease:					
White.....	7,661	9.2	21.6	69.2	100.0
Yellow.....	41,486	5.6	27.9	66.5	100.0
Other grease....	13,247	9.4	10.7	79.9	100.0
Total.....	62,394	6.8	23.5	69.7	100.0
Soapstock or foots:					
Cottonseed.....	2,328	19.7	11.0	69.3	100.0
Soybean.....	2,152	35.9	49.7	14.4	100.0
Other soapstocks or foots.....	2,236	5.2	41.8	53.0	100.0
Total	6,716	20.1	33.6	46.3	100.0
Other fats and oils <u>2/</u>.....					
Total all fats and oils.....	324,163	7.5	18.8	73.7	100.0

1/ In terms of annual production of mixed feed.

2/ Includes other animal and vegetable oils, marine oils, and fatty acids. Does not include formulated vitamin oils or the oil content of such materials as cottonseed meal, soybean meal, fish solubles, tankage, meat scrap, and unrendered animal fats.

Table 3.--Total consumption and percentage distribution of various fats and oils, by size of mill, 1956

Kind and grade	Total all mills	Size of mill <u>1/</u>		
		Less than 10,000 tons	10,000 to 50,000 tons	50,000 tons and over
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Total all fats and oils.....	324,163	24,224	60,994	238,945
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Tallow:				
Fancy.....	25.9	5.2	21.6	29.1
Prime.....	29.0	10.1	22.8	32.5
Other tallow.....	17.9	52.4	25.6	12.5
Total.....	72.8	67.7	70.0	74.1
Grease:				
White.....	2.4	2.9	2.7	2.2
Yellow.....	12.8	9.6	19.0	11.6
Other grease.....	4.1	5.1	2.3	4.4
Total.....	19.3	17.6	24.0	18.2
Soapstock or foots:				
Cottonseed.....	0.7	1.9	0.4	0.7
Soybean.....	0.7	3.2	1.8	0.1
Other soapstock or foots.....	0.7	0.5	1.5	0.5
Total	2.1	5.6	3.7	1.3
Other fats and oils <u>2/</u> .	5.8	9.1	2.3	6.4
Grand total	100.0	100.0	100.0	100.0

1/ In terms of annual production of mixed feed. 2/ Includes other animal and vegetable oils, marine oils, and fatty acids. Does not include formulated vitamin oils or the oil content of such materials as cottonseed meal, soybean meal, fish solubles, tankage, meat scrap, and unrendered animal fats.

Table 4.--Consumption of fats and oils in feeds, by regions, 1956

Kind and grade	Region									
	United States	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	South Central	East South Central	West South Central	Pacific
	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds	pounds
Tallow:	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Fancy.....	1/	30,661	17,114	5,132	4,819	1/	848	559	4,221	
Prime.....	--	1,094	8,668	13,877	32,672	12,798	20,555	1,565	2,844	
Other tallow.....	1/	2,380	17,395	6,060	9,778	1/	10,640	82	7,598	
Total.....	15,160	34,135	43,177	25,069	47,269	22,408	32,043	2,206	14,663	
Grease:	7,661	1/	909	4,225	1/	1/	1/	1/	1/	
White.....	41,486	6,085	18,108	4,471	9,211	3,087	1/	--	1/	
Yellow.....	13,247	1/	3,473	1,555	1/	1/	1,303	--	1/	
Other grease.....										
Total.....	62,394	7,728	22,490	10,251	11,353	7,578	2,504	1/	1/	
Soapstock or foots:	2,327	1/	1/	1/	1/	1/	1/	1/	1/	
Cottonseed.....	2,145	1/	1/	1/	1/	1/	1/	1/	1/	
Soybean.....										
Other soapstocks or foots.....	2,244	1/	1/	1/	1/	1/	1/	1/	1/	
Total.....	6,716	388	816	1,047	1,303	139	2,086	1/	1/	
Other fats and oils 2/	18,923	--	7,904	493	3,216	56	399	266	2,651	
Total all fats and oils.....	324,163	15,436	50,155	36,860	63,141	30,181	37,032	2,500	18,437	
Mills manufacturing mixed feeds:	697	16	91	131	99	51	62	21	81	
Adding fats.....	1,221	32	149	230	216	116	138	55	115	
Not adding fats.....										
Total.....	1,918	48	240	361	315	167	200	76	196	

1/ Withheld to avoid disclosing figures for individual companies.

2/ Includes other animal and vegetable oils, marine oils, and fatty acids. Does not include formulated vitamin oils or the oil content of such materials as cottonseed meal, soybean meal, and fish solubles, tankage, meat scrap, and unrendered animal fats.

Table 5.--Proportion of total consumption of various fats and oils used in feeds, by regions, 1956

Kind and grade	Region														Total
	United States	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total				
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
Tallow:															
1,000 pounds															
Fancy.....	1/	36.6	20.4	6.1	5.7	1/	1.0	0.7	5.0	100.0					
Prime.....	--	1.2	9.2	14.8	34.7	13.6	21.8	1.7	3.0	100.0					
Other tallow....	1/	4.1	29.9	10.4	16.8	1/	18.3	0.1	13.1	100.0					
Total.....	6.4	14.5	18.3	10.6	20.0	9.5	13.6	0.9	6.2	100.0					
Grease:															
White.....	--	1/	11.9	55.1	1/	1/	1/	1/	--	100.0					
Yellow.....	--	14.7	43.6	10.8	22.2	7.4	1/	--	1/	100.0					
Other grease....	--	1/	26.2	11.7	1/	1/	9.8	--	1/	100.0					
Total.....	--	12.4	36.0	16.4	18.2	12.1	4.0	1/	1/	100.0					
Soapstock or foots:															
Cottonseed.....	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/					
Soybean.....	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/					
Other soapstocks or foots.....	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/					
Total.....	6,716	4.1	5.8	12.2	15.6	19.4	2.1	31.1	1/	100.0					
Other fats and oils 2/	18,923	--	41.8	20.8	2.6	17.0	0.3	2.1	1.4	14.0	100.0				
Total all fats and oils.....	324,163	4.7	15.5	21.7	11.4	19.5	9.3	11.4	0.8	5.7	100.0				

1/ Withheld to avoid disclosing figures for individual companies.

2/ Includes other animal and vegetable oils, marine oils, and fatty acids. Does not include formulated vitamin oil or the oil content of such materials as cottonseed meal, soybean meal, fish solubles, tankage, meat scrap, and unrendered animal fats.

Table 6.--Total consumption and percentage distribution of various fats and oils used in feeds, by regions, 1956

Kind and grade	Region									
	United States	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Total fats and oils..	324,163	15,436	50,155	70,421	36,860	63,141	30,181	37,032	2,500	18,437
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Tallow:										
Fancy.....	25.9	1/	61.1	24.3	13.9	7.6	1/	2.3	22.3	22.9
Prime.....	29.0	--	2.2	12.3	37.7	51.7	42.4	55.5	62.6	15.4
Other tallow.....	17.9	1/	4.7	24.7	16.4	15.5	1/	28.7	3.3	41.2
Total.....	72.8	98.2	68.0	61.3	68.0	74.8	74.2	86.5	88.2	79.5
Grease:										
White.....	2.4	--	1/	1.3	11.5	1/	1/	1/	1/	--
Yellow.....	12.8	--	12.1	25.7	12.1	14.6	10.2	1/	--	1/
Other grease.....	4.1	--	1/	4.9	4.2	1/	1/	3.5	--	1/
Total.....	19.3	--	15.4	31.9	27.8	18.0	25.1	6.8	1/	1/
Soapstock or foots.										
Cottonseed.....	0.7	1/	1/	1/	1/	1/	1/	1/	1/	1/
Soybean	0.7	1/	1/	1/	1/	1/	1/	1/	1/	1/
Other soapstocks or foots.....	0.7	1/	1/	1/	1/	1/	1/	1/	1/	1/
Total.....	2.1	1.8	0.8	1.2	2.8	2.1	0.5	5.6	1/	1/
Other fats and oils 2/	5.8	--	15.8	5.6	1.4	5.1	0.2	1.1	10.6	14.4
Grand total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Withheld to avoid disclosing figures for individual companies.

2/ Includes other animal and vegetable oils, marine oils and fatty acids. Does not include formulated vitamin oil or the oil content of such materials as cottonseed meal, soybean meal, fish solubles, tankage, meat scrap, and unrendered animal fats.

Table 7.--Prepared animal feed produced, fats and oils used, and percentage fat used is of feed produced by plants adding fats, 1956

Region	Prepared	Plants adding fats		
	animal feed produced	Prepared animal feed produced	Fats and oils used	Percentage fat used is of feed produced
	1,000 pounds	1,000 pounds	1,000 pounds	Percent
United States	56,035,997 ^{1/}	41,128,309	324,163	0.8
	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>	<u>Percent</u>
Regions				
New England.....	5.0	5.5	4.7	0.7
Middle Atlantic....	12.5	14.2	15.5	0.9
East North Central.	20.1	23.4	21.7	0.7
West North Central.	18.6	17.8	11.4	0.5
South Atlantic.....	12.9	12.3	19.5	1.2
East South Central.	7.5	8.1	9.3	0.9
West South Central.	10.6	8.9	11.4	1.0
Mountain.....	2.2	1.4	0.8	0.4
Pacific.....	10.6	8.4	5.7	0.5
Total.....	100.0	100.0	100.0	--

^{1/} Bureau of the Census inflated this figure about 3 percent to take into account establishments with shipments under \$20,000 in the 1954 Census of Manufactures which were not included in the survey. The inflated figure was published in Bureau of the Census, Facts for Industry Production of Mixed Feeds in Manufacturing Establishments 1956, Series M20E-06, March 20, 1958.

Table 8.--Characteristics of inedible grades of animal fats

Fat	Titer <u>1/</u> (minimum)	F.F.A. <u>2/</u> (maximum)	M.I.U. <u>3/</u> (basis)	F.A.C. color <u>4/</u> maximum untreated and unbleached
	<u>Degrees Centigrade</u>	<u>Percent</u>	<u>Percent</u>	
Tallow:				
Fancy.....	41.5	4	1	7
Choice.....	41.0	5	1	9
Prime.....	40.5	6	1	13 or 11B
Special.....	40.5	10	1	19 or 11C
No. 1.....	40.5	15	2	33
No. 3.....	40.5	20	2	37
No. 2.....	40.0	35	2	No color
Grease:				
Choice white..	37.0	4	1	11
A, white.....	37.0	8	1	15
B, white.....	36.0	10	2	19 or 11C
Yellow.....	36.0	15	2	37
House.....	37.5	20	2	39
Brown.....	38.0	50	2	No color

1/ Fats with melting point of 40° C. or higher are tallows, while those with melting points less than 40° C. are greases.

2/ Free fatty acid content.

3/ Moisture and insoluble and unsaponifiable material present.

4/ Fat analysis committee of the American Oil Chemists' Society, established color standards.

